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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,603	02/22/2002	Ming Yan	LWM-A078	5733

24113 7590 05/05/2005

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EXAMINER	
PAK, SUNG H	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,603	YAN ET AL.	
	Examiner	Art Unit	
	Sung H. Pak	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This application has been revived as per petition decision mailed out to applicants on Jan. 12, 2005. Accordingly, the amendment filed Jan. 03, 2005 has been entered. Claims 1-20 are now pending.

Response to Amendment

Claims 1, 9, and 16 are amended, and new claims 18-20 are added by this amendment. Claims 1, 9, and 16 now contain new matter and they are rejected under 35 USC 112. See Claim Rejections- 35 USC 112 below. The previous ground of rejection is changed in this office action in response to the newly added limitations in claims 1, 9 and 16, as well as the newly added claims 18-20. Since the new ground of rejection was necessitated by the amendment, this office action is made final.

See Response to Arguments, below, for further details.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 9 and 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant

art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, the amendment adds the limitation, "wherein the optical path length is controlled to within ***three nanometers***." (emphasis added; see amended claims 1, 9, 16) On page 7, first paragraph of the applicants' remarks, it is stated that the amended claims are supported by the specification "at page 5, lines 15-16, and page 11, lines 11-18." However, page 5 lines 15-16 merely states "... waveguides of an AWG need to be accurate to within ***a few nanometers***." Also, page 11 lines 11-18 merely states "... the pulsed laser is capable of adjusting optical path length at ***nanometer scale*** increments." Nevertheless, being accurate within "a few nanometers" and adjusting the path length at "nanometer scale" is NOT equal to path length being "controlled to within three nanometers", as claimed in the amended claims. None of the cited portion of the specification, or any other portion of the specification discloses the claimed method, wherein the optical path length is controlled to within ***three nanometers***.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicants are advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 4, 6-10, 12, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (US 5,940,548) in view of Chen et al (US 6,356,681).

Yamada et al. was cited in the previous office action.

Yamada reference discloses a method of optimizing a filter response of an arrayed waveguide grating with all the limitations set forth in the claims, except it does not explicitly teach the optical path length of the waveguides being controlled to within three nanometers.

Specifically, Yamada disclose the steps of: measuring a respective phase error of a plurality of waveguide cores of an arrayed waveguide grating using a low coherent light interferomety (column 14 lines 34-41); adjusting a respective optical path length of the cores in accordance with the respective phase error of the cores by adjusting a respective refractive index of the cores, thereby optimizing a filter response of the arrayed waveguide grating (column 14 lines 42-44);

wherein the respective refractive index is adjusted by using laser energy (column14 lines 42-44);

wherein the adjusting of the refractive index of the cores is used to equalize channel power of the arrayed waveguide grating (column 14 lines 34-44: specifically lines 34-44 states,

inter alia, "measure... the distribution of amplitude errors... Based on these measurements, determine the amount of amplitude adjustment...");

wherein the adjusting of the refractive index of the cores is used to compensate for dispersion within the arrayed waveguide grating (column 14 lines 34-44: specifically lines 34-44 states, inter alia, "measure the distribution of phase errors... Irradiate each arrayed waveguide with laser light to ... compensate for the phase error." The phase error causes dispersion within the waveguide and the compensation of phase error compensates dispersion);

wherein the refractive index of the cores is adjusted within a grating area of the arrayed waveguide grating by using laser energy (column 14 lines 34-44).

Yamada also discloses an arrayed waveguide grating thus optimized with the above methods.

On the other hand, Chen reference explicitly discloses a method of controlling the optical path length of a waveguide via laser to within three nanometers (column 1 lines 55-67). Such arrangement is considered advantageous and desirable in the art, because it allows for highly precise optical device capable of high bandwidth optical communications having very close channel separation. Thus, the overall operating efficiency is significantly increased by having the optical path length controlled to within three nanometers.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yamada method to control the optical path length to within three nanometers. It would be desirable to have an efficient, high fidelity optical device.

Claims 3, 5, 11, 13, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (US 5,940,548) and Chen et al (US 6,356,681).

Yamada in view of Chen render all the recited limitations obvious, as discussed above, *except* they do not explicitly disclose: measuring of phase errors within nanometer resolution (claims 3, and 11); or the use of ultraviolet laser energy (claims 5, 13, and 17).

However, as discussed in the previous office action and maintained in the present office action, measuring of phase errors within nanometer is well known and common in the art. Nanometer resolution is considered advantageous and desirable in the art because it allows for accurate and precise adjustment of phase error, which is desirable in building reliable optical communications device. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Yamada device to have nanometer resolution phase error measurement.

Also, as discussed in the previous office action and maintained in the present office action, the use of ultraviolet laser in changing refractive indexes of optical waveguides is well known and common in the art. The use of ultraviolet laser is considered advantageous and desirable in the art because it provides a simple, reliable and low cost means of modifying refractive indexes of optical waveguides without having to impart structural changes to the waveguides. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yamada device to use the ultraviolet laser.

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (US 5,940,548) in view of Dugan et al (US 2003/0035640 A1).

Dugan et al. reference was cited in the previous office action.

Yamada discloses a method of optimizing a filter response of an arrayed waveguide grating with all the limitations set forth in the claims, except it does not explicitly teach the use of a pulsed laser with number of pulses selected to yield a controlled adjustment of the optical path length.

On the other hand, Dugan reference explicitly teaches the use of ultraviolet pulsed laser with discrete laser pulses to modify the refractive index of an optical waveguide, thereby correcting path length errors in waveguides (paragraphs 0006, 0007, 0033, 0037). This arrangement is taught to be advantageous and desirable over the prior art because it allows for relatively easy and efficient way of altering the optical characteristics of a waveguide (such as optical path length) in a precise increments regardless of the physical shape and form of the optical waveguides (paragraph 0033), and allows for facilitated manufacturing process (paragraph 0006).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yamada device to use ultraviolet laser pulses with number of pulses to yield a controlled adjustment of the optical path length.

Response to Arguments

Claims 1-2, 4, 6-10, 12, 14-16:

Starting on page 7 of the applicants' response, it is argued that Yamada et al does not teach the newly added limitation (i.e. controlling the optical path length of arrayed waveguide grating to within three nanometers.)

First, the examiner respectfully submits that the newly added limitation constitutes new matter. As discussed above, neither the portion of the specification cited by the applicant, nor any other portion of the specification teaches controlling the optical path length of arrayed waveguide grating to ***within three nanometers***. Since the originally filed specification fails to adequately disclose *"three nanometers" as claimed*, the new matter rejection based on 35 USC 112 is proper.

Second, the pending claims, as amended, are rendered obvious over Yamada in view of Chen reference as discussed above. Please refer to Claim Rejections- 35 USC 103 above. Since the new ground of rejection was necessitated by the newly added limitation included in the amendment, the claims are finally rejected.

Claims 3, 5, 11, 13, 17:

Starting on page 8 of the applicants' response, it is argued that Yamada does not teach all of the features of the applicants' invention, as claimed in amended claims 1, 9, and 16, and thus the claimed invention recited in claims 3, 5, 11, 13, 17 is not prima facie obvious over Yamada reference.

The examiner respectfully submits that a new ground of rejection has bee applied to claims 1, 9, and 16 in response to the newly added limitation, and that the claims 3, 5, 11, 13, 17 are thus rendered obvious in view of the new ground of rejection. Please refer to Claim Rejections- 35 USC 103 above.

It is further noted that applicants have not challenged the examiner's Official Notice (that measuring phase error within nanometer, and the use of ultraviolet laser are well known in the

art). In accordance with **MPEP 2144.03 subsection (c)**, "To adequately traverse such a finding [i.e. official notice], an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art. See 37 CFR 1.111(b). See also Chevenard, 139 F.2d at 713, 60 USPQ at 241 ("[I]n the absence of any demand by appellant for the examiner to produce authority for his statement, we will not consider this contention."). A general allegation that the claims define a patentable invention without any reference to the examiner's assertion of official notice would be inadequate." Therefore, the claims are finally rejected.

Claims 18-20:

The examiner respectfully submits that the newly added claims 18-20 are not patentable over the cited prior art as discussed above. Please refer to Claim Rejections- 35 USC 103 above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sung H. Pak
Examiner
Art Unit 2874

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